January-16-13 8:34:38 AM

Item ID: D3997-7 Accept *N900040100* Setup Start **Revision ID:** Item Name: Placard **Start Date:** 1/16/13 **Start Qty: 10.00** *10* Cust Item ID: Required Date: 1/30/13 Req'd Qty: 10.00 **Customer:** Reference: Run Process Plan: MLJ Date:/3-0/-16 Tooling: Approvals: Date: QC: Date: ____ SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Accept Reject Insp. Work Center ID Description **Run Hours** Code Qty **Qty** Number Stamp Draw Nbr **Revision Nbr** D3997 Α 100 0.00 *100* W13-0416 Purchasing 0.00 Memo Purchasing Manufacture as per Dwg D3997 Possible Supplier:Studio Lettrage Material release note required 110 Receive & Inspect for Damage & Mat'l Certs 0.00 *110* Packaging Memo 0.00 Packaging 120 QC6- Inspect dimensions to drawing *120* QC Memo Quality Control

NCR:	Yes	/	No
		,	

WORK ORDER NON-CONFORMANCE / UPDATE

			* , >
	DQA:	Date:	·
	QA Closed:	Date:	a
E	PARTMENT	/PROCESS	
		Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
	Sign & Date	Verification	QC Inspector

Work Order:											
-					DISPOSITION			AGAINST DE	PARTMENT	/PROCESS	
Part No.					Rework Scrap Use-as-is	The	Skid-tube Machining moforming	Crosstube Small Fab Finishing		Water Jet d. Eng. Coor.	Engineering Quality Other
NCR No.					Work Order Update	The	Large Fab	Composite	Rec/Stol	re/Packaging Supplier	Other
Root				Descri	ption of work order update	Initial	Ac	tion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Chief Er	ng Desc	cription	Date	Verification	QC Inspector
Doc/Data											
Equip/Tooling								!			
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	Cracks				Broken/Damaged	Inspe	ction Incomplete		Part Incorre	ct	Weld
	Crushed/0	Crimped.			Burrs	Instru	ictions Incomplete/	'Unclear	Part Lost/M	issing	Wrong Stock Pulled
	Cuffs				Contamination	Mair	itenance		Part Moved		
	Heat Trea	t			Countersink	Misla	beled		Positioned V	Vrong	_
	Inspection	Strip in	Tube		Cut Too Short	Misre	ead		Power Loss/	Surge	Other
	Ripples in	Bend			Drill Holes	Offse	t	<u> </u>	-		
	Torque W	aves in E	xtrusior	۱ [Drawing	Out o	of Calibration				
	Turning Se	equence			Finish	Out o	of Sequence				
	Wave/Tw	ist in Tub	e		Folio	Outsi	de Dimensions				

Page 2

Item ID: Revision ID: Item Name:	D3997-7			Accept	*N900	<u>0401</u> 0) () *	Setup	Start	1/1	S1*
Start Date: Required Date: Reference:	1/16/13	Start Qty: 10.00 Req'd Qty: 10.00	*1(*1(· -	Cust Item I Customer:	D:			Stop	*N	S2*
Approvals:		lan:	Date:			ate:		Run	Start Stop	1/1	R1* R2*
Sequence ID/ Work Center II	D	Operation Description Identify as per dwg & Sto	ck Location:	Set Up/ Run Hours 0.00	Tool ID	Tool # Plan Cod		t Re Qty		Reject Number	Insp. Stamp
120 Packaging Packaging		Memo		0.00			_10.	y			-50 3-07-2
*140		QC21- Final Inspection -	Work Order Release	0.00				10	3/1	102	dA
QC Quality Control		Memo		0.00			— .	_ [111	147	70

Q(301-21

NCR:	Yes	/	No	
		•		

MADE ADDED NON CONFORMANCE / LIDEATE

DQA: ____Date: ____

NCR:	es	/ NO					WORK ORDER NON-C	JUI	VEORI	MANCE / UPL	JAIE	QA Closed:	Date	: :
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	-		· · ·				Rework			Skid-tube	Crosstube		Water Jet	Engineering
Part N	10.					İ	Scrap			Machining	Small Fab	4	d. Eng. Coor.	Quality
NCR N	lo.						Use-as-is Work Order Update			Large Fab	FinishingComposite	Rec/Stor	e/Packaging Supplier	Other
Root					Descr	rip	tion of work order update	1	Initial	Act	ion	Sign &		
Cause		Date	Step	Qty		or	r Non-conformance	Ch	ief Eng	Descr	iption	Date	Verification	QC Inspector
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		Bending				ال	Bend	L	Grain			Ovalized		Pressure/Forced
		Centre No	ot Concer	ntric to	o/s		BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
		Cracks				ال	Broken/Damaged		Inspecti	or Incomplete		Part Incorre	et	Weld
		Crushed/0	Crimped.				Burrs		Instruct	ions Incomplete/U	Jnclear	Part Lost/Mi	ssing	Wrong Stock Pulled
		Cuffs					Contamination		Mainte	nance		Part Moved		
		Heat Trea	t				Countersink		Mislabe	led		Positioned V	Vrong	
		Inspection	n Strip in	Tube	Γ	_]·	Cut Too Short		Misreac	I		Power Loss/	Surge	Other
		Ripples in	Bend		Γ		Drill Holes		Offset					
		Torque W	aves in E	xtrusio	n [Drawing		Out of 0	Calibration				
		Turning S	equence		Γ		Finish		Out of S	equence				
		Wave/Tw	/ave/Twist in Tube Folio				Outside	Dimensions		-	-			

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

January-16-13 8:34:41 AM

Work Order ID: 95648

95648

Parent Item:

D3997-7

D3997-7

Parent Item Name: Placard

Start Date: 1/16/13

Required Date: 1/30/13

Page 1

Start Qtv: 10.00

Required Oty: 10.00

Comments:

IPP rev A 10.01.12 new issue Prelim EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D3997-7P		Purchased	No				Each	0.0000		10			
*D3997-7F) *								**	10		11	

Placard

- 143/1/21 (W)

NCR:	Yes	/ No				WORK ORDER NON-C	100	NFORN	AANCE / UPD	PATE	QA Closed:	Date:	
Work Orde	er: _			_		DISPOSITION	1		a 🗖	AGAINST DE	PARTMENT,	/PROCESS Water Jet]
Part No				Rework Skid-tube Crosstube Scrap Machining Small Fab Use-as-is Thermoforming Finishing Work Order Update Large Fab Composite		Finishing	Prod. Eng. Coor Rec/Store/Packaging Supplie		Engineering Quality Other				
Root Cause		Date	Step	Qty		ption of work order update or Non-conformance	1	Initial nief Eng	Acti Descri		Sign & Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved						·							
						F.	AUL	T CATE	GCIRY				
Landi		Bending Centre No Cracks Crushed/G Cuffs Heat Trea Inspection Ripples in	Crimped, t n Strip in Bend	Tube		General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes		Instruct Mainte Mislabe Misread Offset	on Incomplete ions Incomplete/U nance led	Inclear	Ovalized Over/Under Part Incorred Part Lost/Mi Part Moved Positioned V Power Loss/	ct ssing Vrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
	Torque Waves in Extrusion			, [Drawing		Out of C	Calibration					

Out of Sequence

Outside Dimensions

Date: ____

DQA:

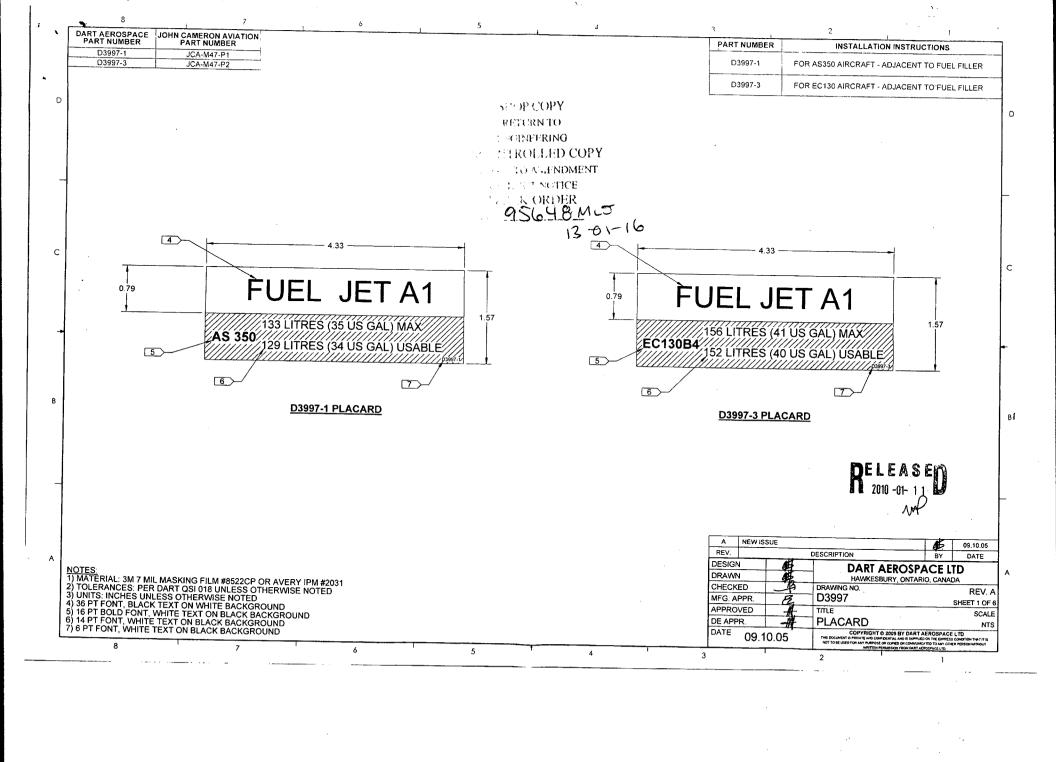
Turning Sequence

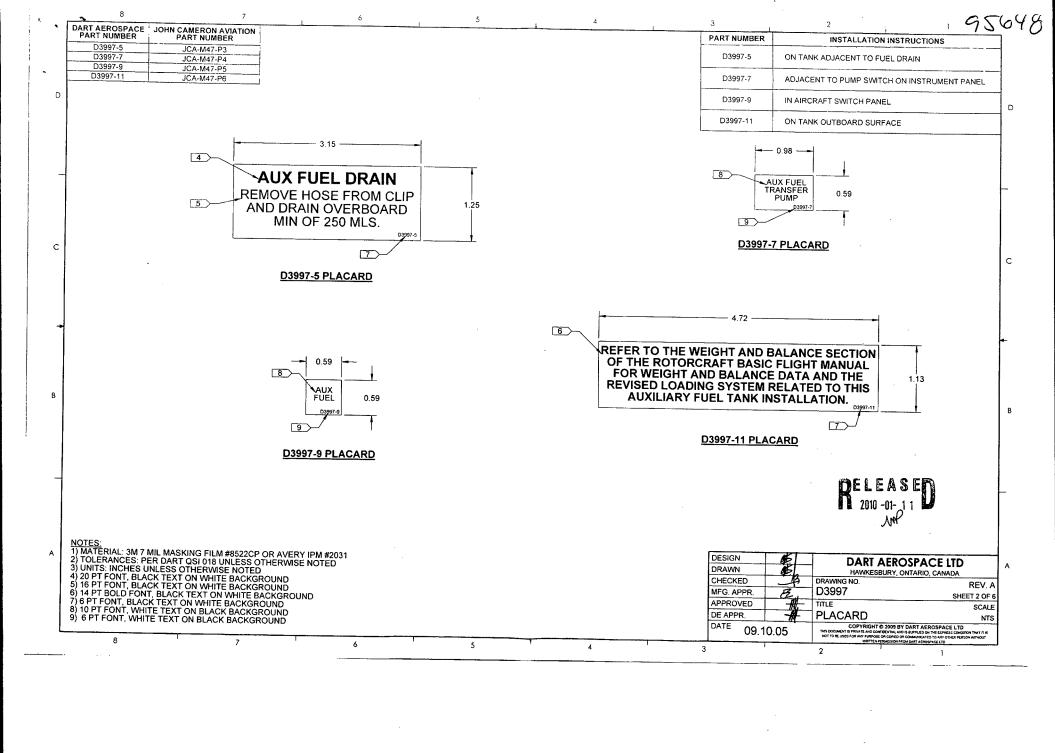
Wave/Twist in Tube

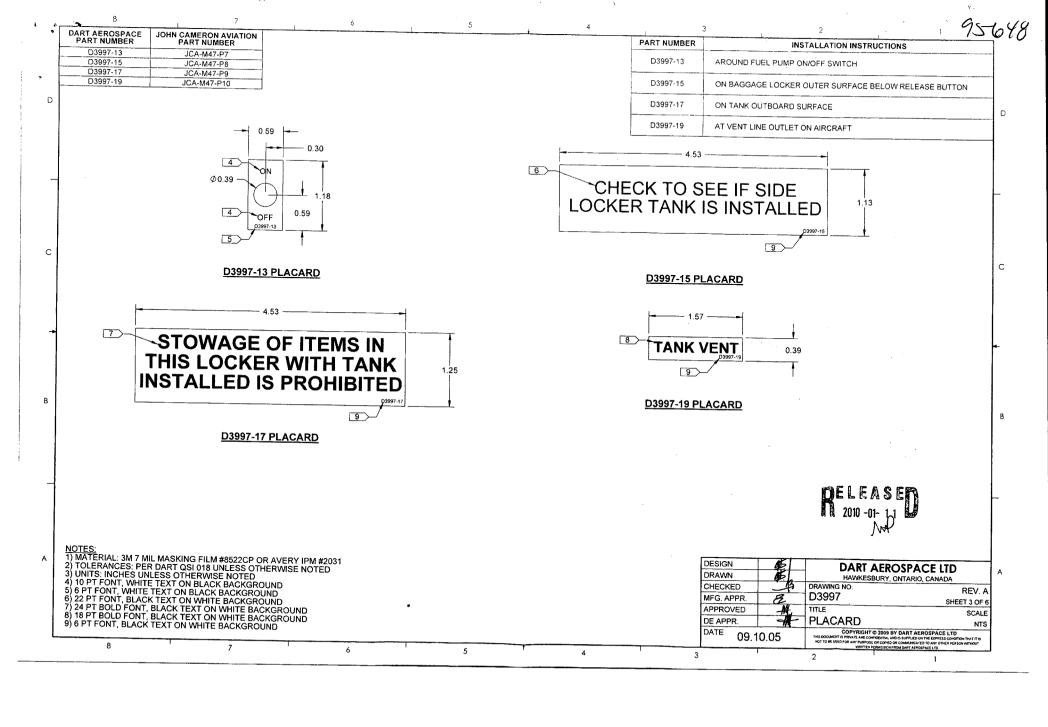
Finish

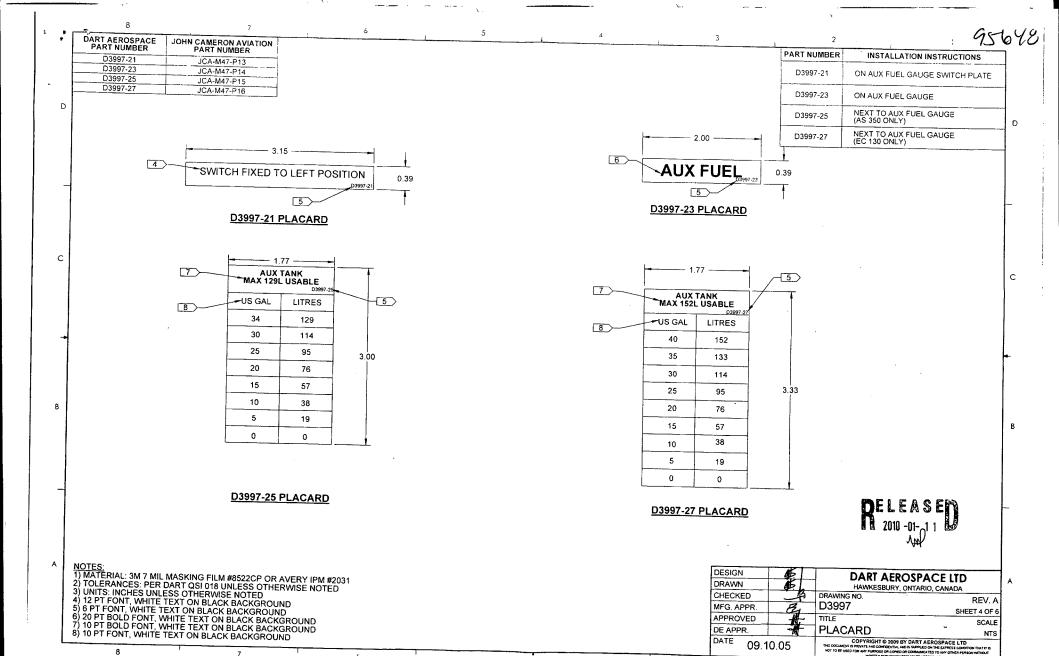
Folio

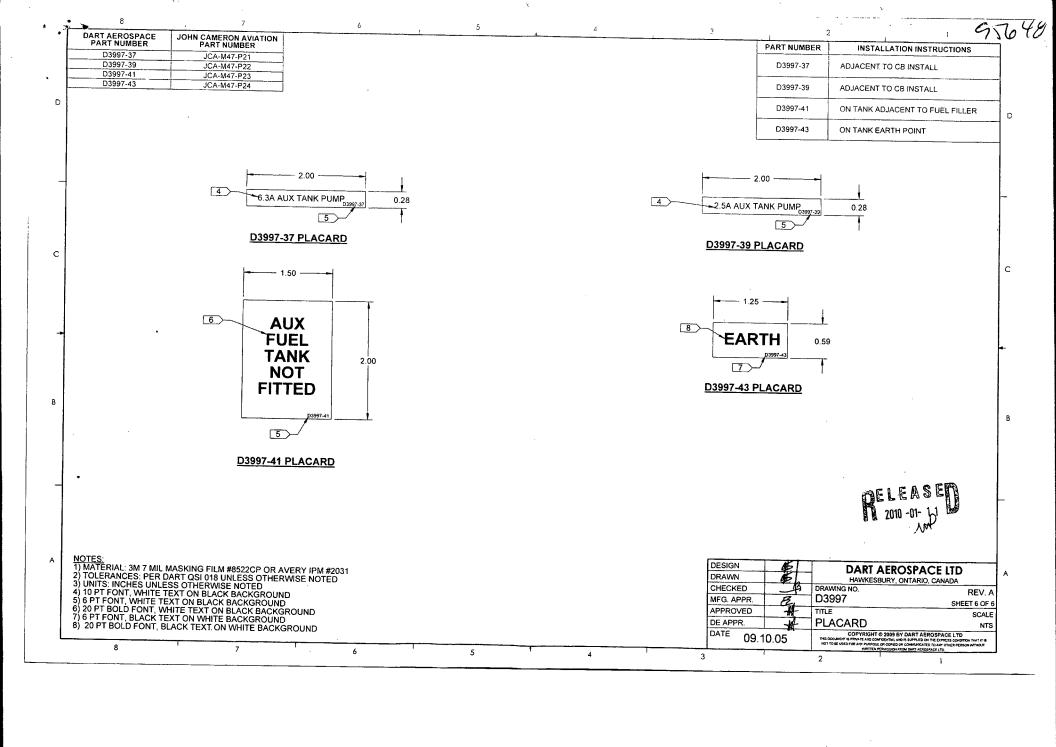
H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G











Studio de Lettrage 210 Main Street W Hawkesbury, Ontario K6A 2H6

INVOICE

Invoice No.:

19413

Date:

01/18/2013

Ship Date:

01/17/2013

Page: Re: Order No.

WO9149

Sold to

Ship to:

Dart Aerospace Ltd

Hawkesbury, Ontario

Dart Aerospace Ltd

1270 Aberdeen Hawkesbury, Ontario K6A 1K7

Business No.:

82500 7651 RT0001

lte	r	No. Unit	Quantity		Description	Antonio (Pagelogia	Tax	Unit Price	Amount
			10 10 10 10 10	D3997-7P D3997-15P D3997-21P D3997-31P D3997-35P D3997-39P D3997-41P PO # 18849 H - HST 13%	2M)		H H H H H H	8.00 8.00 8.00 8.00 8.00 8.00	80.00 80.00 80.00 80.00 80.00 80.00
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****Certificate of	Conformity****	
Customer:		
Studio Lettras	36	
Purchase Order #: Packing Slip #:	Part #:	Serial #:
Description: D3997-3P/D3997-15P/ D3997-21P/D3997-35P/	Quantity:	
D3997-39P/D3997-41P		
Certification:		
We hereby certify that:		
The above the listed items were manufacture accordance with applicable drawings and/o	red, repaired and/or in specifications;	spected in
All work was accomplished in accordance v Purchase Order;	with the Dart Aerospac	e
 Results of all inspections, chemical or phys which shows the acceptability of raw materic components are on file and available for ins 	als, parts and/or asser	ther evidence, nbly
Authority:		-
3M		
APPROVAL: A de Call'a	DATE:	
SUNCY COMIT		. 2
Signature: Sendy Calin	18 Janvion	2013
APPROVAL: Sandy Collin Signature: Sandy Callin Title: Project coordinator		

3M

Product & Instruction Bulletin 8522

Release I, Effective September 2008 See Bulletin Change Summary and end of Bulletin This Bulletin now includes Instruction Bulletin 4.23

ScotchcalTM Changeable Opaque Imaging Media

Product Description

For Thermal Inkjet Printing

Recommended Types of Graphics and End Uses

This durable, 7 mil, opaque, changeable film is optimized for use with selected thermal inkjet printers and inks. Ink dries quickly on the film. When overlaminated, it is warranted for medium term, outdoor weatherable graphics, and long term indoor graphics.

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the $3M^{\,\,}MCS^{\,\,}Warranty$. Please read the entire Bulletin for details.

- First surface images (the image is on top of the film) for opaque posters and signs, including:
 - Graphics for vans, personal vehicles, trucks and buses
 - Novelty posters
 - Retail and point-of-purchase displays
 - Information graphics such as maps and directories
 - Entertainment promotions in museums, zoos, parks, theatres, sports venues
 - -- Education and presentation graphics
 - Legal and courtroom exhibits
- For flat or simple curved surfaces, with or without rivets, used in vertical (± 10°) applications

Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs or recommend other products.

Unsuitable End Uses for This Product

- Not for electronically cut individual letters and numbers
- Fleet applications in areas that use salt for winter road maintenance
- · Application to non-warranted substrates, including wallboard
- · Applications subjected to gasoline vapors or spills
- Application to corrugated or highly irregular surfaces or sharply raised areas
- Graphics applied to stainless steel, including stainless steel vehicles
- On flat surfaces with rivets, tenting of 4 to 10 mm around rivets may be expected; rivets may be cut around to eliminate tenting.
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

About Water-Based Inkjet Technology

Standard inkjet technology is water based. Water-based chemistry is susceptible to the extremes of heat and humidity. This is a factor in most product constructions on the market. Read the Fabrication, Shelf Life and Storage sections in this Bulletin. Staying in the middle of these ranges always provides optimum performance.

Compatible Products

3M Graphic Materials

For complete details about graphic construction options, recommended uses and durability, refer to the Product Bulletin for the base film or substrate (media) you are using. See **3M Related Literature** at the end of this Bulletin.

This Bulletin provides details about the base film and construction options and warranty. Additional specific information about compatible products can be found in the Product and Instruction Bulletins listed in **3M Related Literature** at the end of this bulletin.

3M Graphic Materials

For complete details about graphic construction options, recommended uses and durability, refer to the Product Bulletin for the base film or substrate (media) you are using. See **3M Related Literature** at the end of this Bulletin.

Film

3M™ Scotchcal™ Opaque Imaging Media 8522

Overlaminate

- 3M™ Scotchcal™ Luster Overlaminate 8519
- 3M[™] Scotchcal[™] Matte Overlaminate 8520

Printers and Inks

HP Designjet Printers	HP Inks
 2500CP and 2000CP 2800CP and 3800CP 3500CP and 3000CP HP Designjet 5000 and 5500 	 Designjet CP Ink System UV (pigment-based) Designjet CP Inkjet System (imaging ink)
• Z6100	HP 91 Vivera Ink System

Epson Printers	Epson Inks
Stylus Pro 9500	Archival Inks
 Stylus Pro 10000 printer 	
Stylus Pro 10600 printer	

Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

Characteristic	Description					
Media	7 mil, white, opaque graphic film					
Liner	Low-slippage, lay flat paper					
Adhesive	Changeable, pressure sensitive					
Thickness	Media with adhesive: 7.5 to 8 mil (nominal)					
Warranted application substrates	See next page.					
Application surfaces	Flat or simple curved surfaces, with or without rivets, used in vertical (± 10°) applications (no corrugations)					
Application temperature range	28° to 110°F (-2° to 43°C) (air and surface)					
Removable	For up to one year; see Warranty Information					

Characteristic	Description					
Warranted application substrates	Some substrates may "out-gas", resulting in tiny bubbles throughout the surface of the graphic. For maximum performance, be sure the substrate you select is properly cleaned and prepared as recommended by the manufacturer. See Instruction Bulletin 5.1 for additional information.					
	Alodine (anodized aluminum)					
	Automotive panels (automotive painted steel)					
	Fruehauf (painted aluminum)					
	FRP (fiberglass reinforced plywood)					
	Glass					
	Imron ® (polyurethane-painted metal panel)					
	Acrylic					
	Sintra ™ board					
	Note: Use on any other substrate is strictly on a graphics manufacturer and customer test and approve basis. Test for both adhesion and removal characteristics. The plasticizer in some banner materials may migrate. This may cause the edge of the graphic to peel or lift off of the banner. For optimum performance, follow the guidelines in the section, Creating A Laminated Overlap, on page 4.					

Warranty Information

The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor. The warranties in the following table(s), given in years, are for finished graphics exposed in a vertical exposure in the United States except the Desert Southwest. See the warranty sections following this table for additional information.

3M[™] MCS[™] Warranty Durability for Finished Graphics

Construction (film and overlaminate on	HP Printers & Inks		Epson Printers & Inks		Removal
warranted substrate	Outdoor	Indoor	Outdoor	Indoor	
8522/8519 8522/8520	3 years	5 years	2 years	5 years	1 year without chemical strippers or tools

Warranty and Limited Remedy

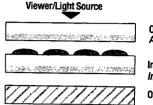
The following is made in lieu of all other express or implied warranties, including any implied warranty of **merchantability** or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

Graphic Construction Options

Opaque Graphics

Opaque graphics made with imaging media 8522 require an overlaminate and an opaque substrate.



Overlaminate 8519, 8520 Adhesive on bottom

Imaging Media 8522 Image on top; adhesive on bottom

Opaque Substrate

Fabrication

Different combinations of shop temperature and humidity can affect the handling of the media, the protective finish and the printed graphic. For optimum performance, use the *middle* of each of these ranges whenever possible.

Shop Temperature

Acceptable: 60° to 95°F (15° to 35°C) Optimum: 65° to 73°F (18° to 23°C)

Shop Humidity

Acceptable: 20% to 80% Optimum: 45% to 60%

Condition the Media Before Use

These steps are especially important if you are operating outside the conditions recommended under Fabrication, above.

- Leave the media in its original packaging until you are ready to condition and use it.
- The day before you need it, remove the media from the box and remove the plastic.
- Condition the media for 24 hours in the same environment as the printer.

Printer Settings for Optimum Quality

Refer to your Hewlett Packard printer manual for detailed operating instructions.

The quality of a printed image depends on a combination of factors: correct media selection, printing software and raster imaging processor (RIP), shop conditions, etc.

The printers qualified to use this media have print mode options that are programmed specifically for these media. Current charts that show the various modes and printing dpi, and the quality results you can expect are available at www.hp.com under the website's support section. We recommend that you print the same image at all of these settings to determine acceptable print and productivity results.

The highest quality settings are usually desirable for backlit applications.

The correct media selection makes most other necessary adjustments to the printer.

- For the HP DesignJet CP 2000 or 3000 series printers, select the Opaque Vinyl UV setting.
- For the HP Designjet 5000 series printers, select the 3M Changeable UV setting or the HP Durable Gloss UV or HP Colorfast Vinyl setting.
- For the Z series printers, refer to HP's website or printer manuals.

Note: The HP printer settings lay down less ink per pass, which results in better ink absorption and quicker drying times.

- For the HP DesignJet CP 2000 or 3000 series printers, select the Opaque Vinyl UV setting.
- For the HP Designjet 5000 series printers, select the 3M Changeable UV setting or the HP Durable Gloss UV or HP Colorfast Vinyl setting.
- For the Z series printers, refer to HP's website or printer manuals.

Note: The HP printer settings lay down less ink per pass, which results in better ink absorption and quicker drying times.

Drying Guidelines

Usually, the media can be laminated within 10 minutes after printing. However, especially in high humidity conditions, we recommend waiting 15 to 30 minutes before laminating.

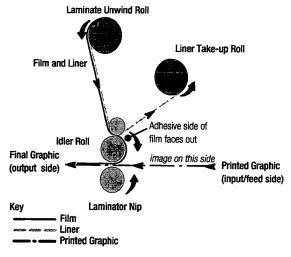
Use care when handling graphics that have not been laminated to avoid scratching and abrasion.

Graphics made with this media and ink combination typically may be wound directly on a take-up roll after printing.

Whether or not you want a warranted graphic, an overlaminate is recommended to enhance durability, especially in outdoor applications.

Overlaminate

FIGURE 1
Typical Laminator Thread-up



Creating a Laminated Overlap

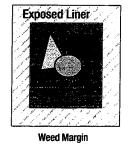
Creating a laminated overlap helps ensure that the graphic does not peel or lift away from certain banner materials that may be subject to plasticizer migration. This method may also be used for flat, rigid or flexible sign applications.

- 1. Print the graphic as usual.
- 2. On all sides of the graphic, score the film only to the correct, final graphic dimension without cutting through the liner.

Weed away the excess film, leaving the bare liner exposed around the graphic. See FIGURE 2.

FIGURE 2 Trim and Weed Film Margin Only





3. Laminate the graphic as usual (see page 5), making sure that at least one inch of the bare liner is covered by the laminate. See FIGURE 3.